

# LISTing Newsletter

Newsletter of the Long Island  
Sinclair/Timex Users Group

January 1994 Issue  
NEXT MEETING JAN 9, 1994

January 1



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## *Listing Policy*

*Annual Dues \$16.00*

One "sample" copy sent upon receipt of Business size SASS.  
Copies provided on EXCHANGE BASIS with other bona fide user  
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LIST (Long Island Sinclair Timex) Group, a not for profit user group.

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\*\*\*\*\*  
 LIST OFFICERS  
 ++++++  
 PRES. HARVEY RAIT  
 V.P. BOB GILDER  
 TRES. ROBERT MALLOY  
 COR. SEC. JOHN FAZMINO  
 EDITOR. FRED STERN  
 LIBR. TOM SKAPINSKI  
 ++++++

PLEASE SEND INQUIRIES TO:  
 LIST  
 MR. HARVEY RAIT  
 5 PERI LANE  
 VALLEY STREAM, N.Y. 11581

PLEASE SEND SUBMISSIONS TO:  
 LISTING  
 MR. FREDERIC STERN  
 P.O. BOX 264  
 HOLBROOK, N.Y. 11741  
 \*\*\*\*\*

COMING EVENTS:  
 \*\*\*\*\*  
 JAN. 09, 1994 LIST MEETING.

\*\*\*\*\*  
 \*\*SPECIAL NOTICE\*\*  
 \*\*\*\*\*

THE NEXT MEETING WILL BE HELD AT  
 THE ICE CREAM DISPENSARY  
 (HARVEY'S STORE)  
 334 DOGWOOD AVENUE  
 FRANKLIN SQUARE, N.Y.  
 TEL: 516-486-1090

DIRECTIONS: SOUTHERN STATE PKWY  
 TO EXIT 17 NORTH (HEMPSTEAD AVE)  
 GO TO FIRST TRAFFIC LIGHT,  
 LEFT TURN ON TO CORNWALL,  
 NEXT TRAFFIC LIGHT, BEAR RIGHT  
 ON TO DOGWOOD AVENUE. GO 1 MILE  
 TO THE ICE CREAM DISPENSARY, IN  
 A SMALL SHOPPING CENTER ON THE  
 LEFT SIDE OF THE ROAD.

MEETING MINUTES  
 \*\*\*\*\*  
 REPORTED BY: FRED STERN  
 DEC. 12, 1993

\*\*\*\*\*  
 HARVEY CALLED THE MEETING TO  
 ORDER AT 2:25PM.

IN THE MAIL WE RECEIVED 3 MEMB-  
 ERSHIP RENEWALS.

GET WELL WISHES ARE EXTENDED TO  
 BOB GILDER WHO IS RECUPERATING  
 FROM A SINUS INFECTION.

GOOD LUCK TO FRED WHO WILL HAVE  
 EYE SURGERY ON DEC. 15.

TECHNICAL ROUNDTABLE  
 \*\*\*\*\*

FRED VISITED EDLIE ELECTRONICS  
 AND REPORTED THAT IT IS HACKERS  
 HEAVEN. ONE SIDE OF THE STORE  
 HAS SHELVES OF USED AND SURPLUS  
 ELECTRONICS EQUIPMENT.

USED COMPUTERS INCLUDED:  
 COMMODORE-64, TI-99, AND ATARI.  
 TIMEX COMPUTERS SELL AS FAST AS  
 THEY COME IN ACCORDING TO THE  
 REPRESENTATIVE FRED TALKED TO.  
 IF YOU CAN NOT VISIT THEM, GET  
 THEIR 1994 CATALOG.

EDLIE ELECTRONICS  
 2700 HEMPSTEAD TURNPIKE  
 LEVITTOWN, L.I., N.Y.  
 11756-1443  
 TEL. 516-735-3330  
 TELL THEM YOU WERE REFERED BY  
 L.I.S.T.

SWAP MEET IS COMING.  
 \*\*\*\*\*

LIST WILL BE HOLDING A JANUARY  
 SWAP MEET WITH A TWIST.  
 IN ORDER FOR OUT-OF-TOWN MEMBERS  
 TO BE ABLE TO PARTICIPATE, THIS  
 YEAR WE WILL DO SOMETHING NEW.  
 SEND A LIST OF EQUIPMENT THAT  
 YOU WANT TO SELL OR BUY OR SWAP.  
 AT THE JANUARY LIST MEETING ALL  
 THE LISTS WILL BE COLLECTED AND  
 PUBLISHED IN THE FEBRUARY ISSUE  
 OF LISTING. ALL MEMBERS WILL  
 THEN HAVE THE OPPORTUNITY TO BUY  
 OR SELL THE EQUIPMENT THEY  
 DESIRE.  
 ON THE EQUIPMENT LIST YOU SEND  
 PLEASE INCLUDE:  
 YOUR NAME  
 YOUR ADDRESS  
 QUANTITY AND TYPE OF ITEM  
 PRICE FOR ITEM YOU ARE SELLING  
 SELLING OR SWAPPING  
 WHAT YOU WILL SWAP FOR  
 WHAT YOU WANT TO BUY

CLASSIFIEDS  
 \*\*\*\*\*  
 THIS CLASSIFIED SECTION IS  
 AVAILABLE TO ALL LIST MEMBERS  
 FREE OF CHARGE.  
 THE ONLY RESTRICTION IS THAT  
 IT IS TO BE USED ONLY FOR THE  
 SEEKING, SELLING OR SWAPPING  
 OF SINCLAIR, TIMEX OR MICROACE  
 COMPUTER EQUIPMENT, PERIPHERALS  
 AND SOFTWARE.  
 LISTING, LIST, AND ITS OFFICERS  
 DO NOT ENDORSE, WARRANTY, OR  
 GUARANTEE ANY OF THE ITEMS  
 LISTED IN THIS CLASSIFIED  
 SECTION

\*\*\*\*\*  
 THE FOLLOWING PUBLICATIONS ARE  
 AVAILABLE ONLY THROUGH LIST:

ZX-81/T31000 TECHNICAL TIDBITS  
 TECHNICAL TIDBITS PART II  
 SAVINGS AND LOAD OF THE TIMEX  
 COMPUTER  
 \$4.00 EACH.

I NEED THE DOCUMENTATION FOR THE  
 FOLLOWING PROGRAMS USED ON THE  
 T31000:  
 MINI-MOD 1.5  
 Z-COMM  
 FREDERIC STERN, LISTING EDITOR.

I AM LOOKING FOR DIRECTIONS OR  
 DOCUMENTATION FOR THE ZX ASSEM-  
 BLER AND DISASSEMBLER BY BOB  
 BERCH.  
 MR. WAYNE KNAUST  
 2 PEAR TREE COURT  
 ST. PETERS, MO. 63376

\*\*\*\*\*  
 CONTINUE  
 PAGE 3



## A FINAL WORD

\*\*\*\*\*  
MY NAME IS FRED STERN AND I AM  
THE EDITOR OF THIS EDITION OF  
LISTING.

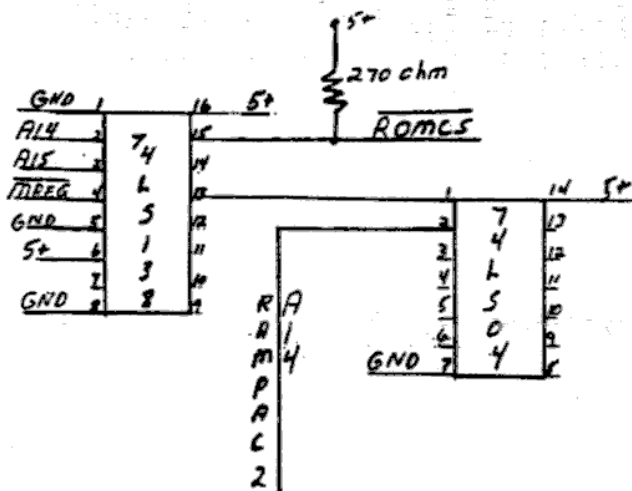
THANK YOU TO TOM SKAPINSKI FOR  
HIS CONTRIBUTION TO THIS ISSUE.

RECOGNITION AND THANKS ARE  
EXTENDED TO:  
N.A. PASHTOON - SINC LINK  
RENE BRUNEAU - SINC LINK  
G.F.C. - ZX APPEAL  
W.E. MCKELVEY - I.S.T.U.G.  
ROD GOWEN - PLOTTER  
D. DAILEY - HACKER  
FOR THEIR ARTICLES WHICH APPEAR  
IN THIS ISSUE OF LISTING.

A VERY SPECIAL THANK YOU TO  
HARVEY FOR HIS HOSPITALITY, AND  
THE USE OF HIS STORE FOR OUR  
MEETING. ALSO TO MIKEY FOR HIS  
CONTRIBUTIONS.

A HEALTHY AND HAPPY NEW YEAR TO  
ALL OUR FRIENDS IN THE TIMEX  
SINCLIPR COMMUNITY FROM THE  
MEMBERSHIP OF I.S.T.U.G.

## HACKERS NOTEBOOK...



THIS CIRCUIT WILL ENABLE A SECOND 16K TIMEX RAMPACK FOR 32K OF  
BASIC PROGRAM RAM. FIRST YOU NEED SOME WAY OF SPLITTING THE EDGE  
CONNECTOR SO THAT YOU HAVE TWO PLACES TWO PLUS ON THE RAMPACK'S AND  
A THIRD FOR A THROUGH CONNECTOR. RAMPACK ONE (16 TO 32K) WILL  
CONNECT AS NORMAL WITH NO INTERUPTION TO IT'S SIGNALS. RAMPACK TWO  
(32 TO 48K) WILL HAVE ALL IT'S NORMAL CONNECTIONS EXCEPT THE A14  
LINE. THE OUTPUT FROM PIN TWO OF THE 74LS04 IS SUBSTITUTED FOR  
THE A14 LINE TO THE SECOND RAMPACK. AS WIRED ABOVE, THE 74LS138  
WILL DECODE ADDRESSES IN 16K CHUNKS. THE OUTPUT FROM PIN 15 IS  
FOR NON DECODING. IF YOU HAVE ANOTHER BOARD IN USE THAT DECODES  
THE NON TIMEX CONNECTION IS NOT NECESSARY. THE 74LS04 IS A HEX  
INVERTER TO CHANGE THE ACTIVE LOW SIGNAL FROM THE 74LS138 TO  
ACTIVE HIGH. THE TIMEX RAMPACK'S DRAW ALOT OF CURRENT, SO  
DEPENDENT ON HOW MANY BINKS YOU HAVE PLUGGED IN, YOU MAY CONSIDER  
PROVIDING A SEPARATE POWER SUPPLY (+5 & +9). THE MOD WORKS FINE  
ON A MAC T/S 1000.

TS 1000 Memory Expansion - D. Dailey

732058

\*\*\*\*\*  
O.D.T.O. - 11/80  
\*\*\*\*\*

## 12-VOLT MODIFICATION

This little mod helps clean up the picture and the computer  
runs cooler, especially if you have more than one peripheral  
attached.

Using proper care, open your beloved 2068. Using Figure  
#1, find the 78L12 voltage regulator. It looks like an  
ordinary transistor (Only good for milliamps). Using great  
care, remove it. Make sure the holes are cleaned out. Now  
install the 78M12 (larger for more current) - Radio Shack  
part #276-1771, about \$1.50. Use Figure #2, noting that it  
is the BACK of the regulator that should be facing up.  
Now for the test! Move everything away from the circuit  
board, with the keyboard unattached, and power up.

Your 2068 should display the copyright notice. If it does  
not, power off immediately! Check the orientation of the  
7812. If you have a volt meter check the input and output.  
When you have everything going well, put your 2068 back  
together and gaze into your nice clean picture.

By William E. McKelvey, I.S.T.U.G. Newsletter,  
May/June, 1992

Inspired by Tim Stoddard, TIME DESIGNS, Vol. 3, No. 5

## INSIDE YOUR 2068

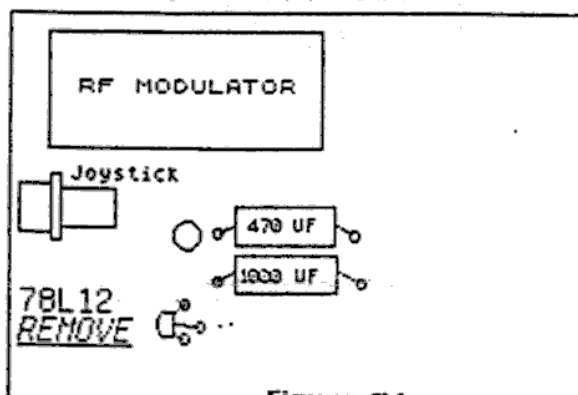


Figure #1

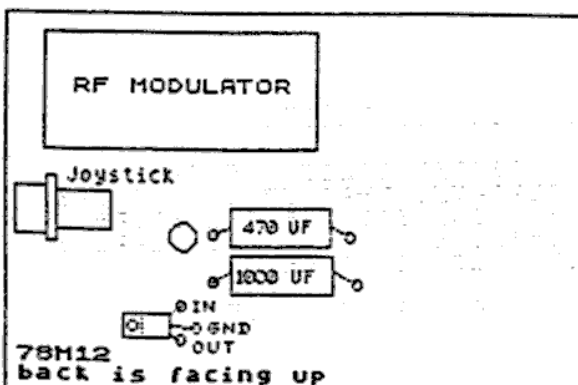


Figure #2

## CALENDAR OF 1994 L.I.S.T. MEETINGS

JANUARY 1994						
SU	MO	TU	WE	TH	FR	SA
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					
LIST MEETING 9TH						

FEBRUARY 1994						
SU	MO	TU	WE	TH	FR	SA
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					
LIST MEETING 13TH						

MARCH 1994						
SU	MO	TU	WE	TH	FR	SA
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		
LIST MEETING 13TH						

APRIL 1994						
SU	MO	TU	WE	TH	FR	SA
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
LIST MEETING 10TH						

MAY 1994						
SU	MO	TU	WE	TH	FR	SA
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				
LIST MEETING 15TH						

JUNE 1994						
SU	MO	TU	WE	TH	FR	SA
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	24
26	27	28	29	30		
LIST MEETING 12TH						

JULY 1994						
SU	MO	TU	WE	TH	FR	SA
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						
NO LIST MEETING						

AUGUST 1994						
SU	MO	TU	WE	TH	FR	SA
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			
NO LIST MEETING						

SEPTEMBER 1994						
SU	MO	TU	WE	TH	FR	SA
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	
LIST MEETING 11TH						

OCTOBER 1994						
SU	MO	TU	WE	TH	FR	SA
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					
LIST MEETING 9TH						

NOVEMBER 1994						
SU	MO	TU	WE	TH	FR	SA
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			
LIST MEETING 13TH						

DECEMBER 1994						
SU	MO	TU	WE	TH	FR	SA
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
LIST MEETING 11TH						

VACATION SCHEDULE





QL Woes  
by  
N.A. Pashtoon



In Vol. 10-6 (Nov.-Dec. '92), and Vol. 11-3 (Mar.-Apr. '93) issues of SINC-LINK mention is made of problems some of the QL users are experiencing. In the paragraphs to follow I will relate my experience in solving similar problems.

1) In the Nov.-Dec. '92 issue Bill Lawson has mentioned a myriad of symptoms of his malfunctioning QL system. Let me hope that he has resolved and sorted out the problems he was facing. The symptoms he has mentioned, and a few more, applies to approximately a dozen QLs in my user group (CATUG) and my own. These problems invariably surfaced when a daughter board with Minerva or an alternative QDOS EPROM was installed on the QL. To solve these problems, proceed as follows:

a) All the important integrated circuits on the QL are socketed. Computers from LISA to first shipments of ATARI ST and other computers were plagued by unreliable operation because of this. The same is true of QL. Many times the microdrive problems and blanking unreliable video is directly traceable to the ZX8302 and ZX8301 chips. Note that these two ICs are CMOS, and static-sensitive. At least touch a metal object with your fingers before you touch the ICs. When you open your QL, it is advisable to spray the pins and sockets of these ICs, as well as the other socketed ICs with a "tuner cleaner", such as Radio Shack #64-3320, or equivalent. After spraying, use a flat-bit screw driver, or a butter knife to displace slightly upwards, from both ends, the ICs in their sockets. Spray again, and press the integrated circuits back in place. This cleaning should be good for at least a year.

b) As mentioned earlier, many users who had fully functional machines, started having problems when they installed a small EPROM daughter-board inside the QL. So what happens under these circumstances? After carefully studying the problem in about a dozen cases, I concluded that the problem is caused by hairline cracks in the copper traces of the daughter board. How are these hairline cracks caused?

After watching my user group members, and my own practice of how do I normally install the daughter-board on the QL mother-board, it became obvious that we were responsible for causing the problem. To explain, normally we would first install the daughter-board by pressing on the corner of the board, and then press-in the EPROM. Here both the procedure as well as the order in which the task is performed is wrong. Why?

The daughter-boards we were using, (to keep costs down, this is true of all peripheral boards, and the QL mother board), are of a very flimsy construction, with very thin copper traces. As the figure shows, two sockets are installed side-by-side, with approximately 0.2" spacing, one socket used for the EPROM is an ordinary dual-leaf socket, and the other one a machined socket. The pins of the machined socket

protrude, and is fitted in the ROM socket on the QL mother-board. In order to install two sockets side-by-side one has to saw-off the stabilizing plastic bridges (two or three) which every socket has. The consequence of this is that when you want to install an EPROM in the normal socket, it flexes the socket rows sideways, so much so, that some times it is not possible to install the EPROM. This flexing causes the hairline cracks in the copper traces on the back of the daughter-board. Belatedly one discovers that in order to install the EPROM, one has to hold the two rows of the socket pins of the normal socket vertically by one hand, and then fit the EPROM in the socket. We discover this after we have already caused damage to probably more than one trace.

The second mechanism causing the cracks, is the way we normally install the flimsily made daughter-board, by pushing on the corners of the board. This method of installation causes too much pressure on the corner pins of the machined socket, and possible hairline cracks.

As such, the suggested procedure for installation is to first install the EPROM on the daughter-board, while holding the normal socket in a vertical position in one hand, thus avoiding the flexing of the pins of the normal socket. Second, install the daughter-board on the mother-board by pressing on the top of EPROM, thus causing the pressure to be equally distributed on all the pins of the machined socket.

All these hassles could have been avoided if the boards were properly manufactured. For example, metalization both on top and bottom of the daughter-board would have helped. Most importantly, instead of using a low cost machined socket, the use of DIP socket carrier (say Dig-Key #ED6028, \$3.26) would have totally solved the problem. In this case you will have the benefit of machined pins, with the pins flush on top, thus allowing the normal socket straddle the socket carrier pins on top, without the stabilizing plastic bridges being sawed-off. But as you can see, this will almost double the price of the daughter board.

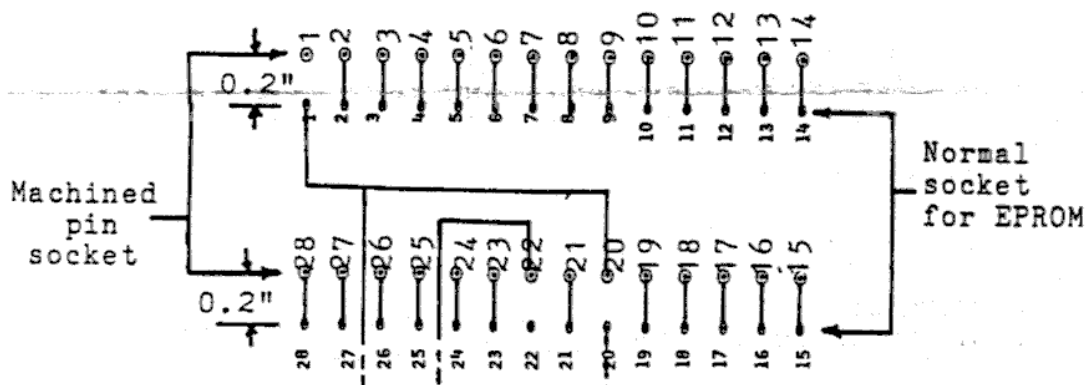


FIGURE: Partial back view of the daughter-board. The decoder IC, which on my board is a 74HCT00, is not shown.

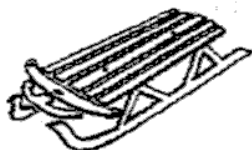
The hairline cracks that I mentioned, are hard to see, even under a magnifying glass. Static testing by continuity measurements (using a VOM) could also be misleading. One can dynamically test by say, using a logic probe. One may even be tempted to cure the problem by putting solder globs on the affected traces. I recommend against it. The only sure method of solving the problem is, to do point-by-point wiring between the pins of the two sockets. This is much easier than it sounds. As shown in the figure, the two sockets are separated by a distance of 0.2", with all the respective pins connected by copper traces, excepts pins 1, 20, and 22. I use bare wire-wrapping (28 gauge) wire. Make a tiny hook on one end of the wire, solder it to the pin, wrap the wire on the corresponding pin of the other socket for half a loop, solder and cut the wire with a razor blade or Xacto knife at the base of the pin. Do all the 25 pins shown in the diagram. This will, with high probability, solve your problem. In the worst case you may have to duplicate all the traces on the back of the daughter-board using wire-wrap wire. Do not use a soldering iron rated higher than 15 watts.

c) A third source of the cracks, is the protrusion of the daughter-board on top of the QL mother-board, and being pressed by the back of the keyboard. On the Samsung QLs, there is a screw on the back of the keyboard, which interferes with the top of the new EPROM that you install. One must remove this screw. Even the removal of this screw does not solve the problem, always. It is suggested that of the eight screws holding the keyboard and the base of the QL together, two screws, one in back and one in front, not be installed. These are the screws which are left of center, roughly in alignment with the ROM sockets. It is worth mentioning, that depending on the height of the daughter-board, even the mother-board can be flexed by the pressure exerted through the daughter-board from the keyboard.

II) In The Mar.-Apr. '93 issue of Sink-Link in an article by Hugh Howie, "NOTES ON QL LOCK-UPS", Hugh says, and I quote: "I know of one person who has four QL's and is only now starting to have some success with one of them. Power Surges?"

Some QLs have exhibited this problem since its introduction into the market place. I have analysed the problem, and I believe I have a low cost solution. I suggest that Hugh inform his friend to contact me, and send me a self-addressed jiffy bag with an IRC, and I will mail his friend my solution in return mail. My address follows:

N.A. PASHTOON  
940 BEAU DR., #204  
DES PLAINES, IL 60016  
U.S.A.









## ZX81

### NEW LOCATIONS FOR M/C ROUTINES IN A 64K RAMPACK

Retyped from the Sept 1985 issue of Vancouver N/L "ZXAPPEAL"

Those of you who, like me, have a 64K Rampack know that the area between 8 and 16K is a great spot to put your favourite machine code routines.

The trouble is that a lot of commercially available peripherals, made for the ZX81, use up some or all of this area by squatting their ROMs all over it.

On a normal ZX81, machine language programs do not run above 32K; there is however a solution. It comes to us from Christofer Tolis, who lives in Stockholm, Sweden; via Glen Read, who noticed it in the British mag: "Electronics and Wireless World".

As you may know, when address line A15 goes high (and M1 low, which means an OPcode fetch is in progress, as opposed to a data fetch, this is the reason you can store data above 32K in the first place) the Ferranti chip kicks in the display routines. See also ZXappeal April '85.

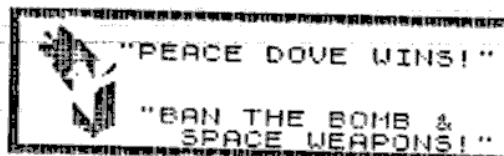
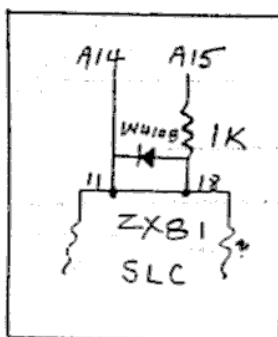
To avoid all this we simply make sure A15 can not go high (at the Ferranti chip) unless A14 does the same, which it will not do when you are running a machine language routine between 32 and 48K.

Don't worry A14 will be high when a legitimate display needs generating as long as the display file lives in the Sinclair sanctioned 16 to 32K area. This means that your BASIC program, which fills up the space between the system variables and the display file, must be less than 15K, in order to keep the display file within the 32K border, but programs that long have yet to be written for the ZX81.

#### TO DO THE DEED:

Cut the trace at the Ferranti #18 pin and install a 1K resistor. Solder a diode between pins 11 and 18 on the Ferranti side of the resistor using the correct polarity, and, voila, yet another 16K to put your favourite machine language routines. Oh and by the way, these routines are of course safe from the reset button just as they are in the 8 to 16K area. You knew that, didn't you?

Retyped by G.F.C.



# RMG UPDATE NEWS FOR NOVEMBER 1993

Volume 5, Number 11

\*\*\*\*\*  
PLOTTER - 11/93  
\*\*\*\*\*

## \*\* RMG NEWS \*\*

Welcome back! We hope that you are enjoying fall and that you and yours are all in good health. We look forward to hearing from you from time to time and it seems that we always hear more from more of you in the fall. Could it be that you are getting more time on your computers than in the spring and summer?

We are still sorting boxes and finding things that we could not locate earlier or that we did not realize that we still had in stock! We hope that those of you who have ordered things that we could not find will bear with us. It may be a while, but we will eventually get to all of the boxes. In going through all of these boxes, we find that we have a bit too many of certain items in stock and would like to see someone making better use of them than sitting in our storeroom. On the back of this sheet you will find a list of specials on our PRE-CHRISTMAS CLEARANCE SALE. We hope that you will see something on it you can use.

## NEWSLETTERS AND USER GROUPS

Are you aware of all of the resources that are available to you as a Sinclair/Timex user? If not, read on! There are a lot of good newsletters still being published by several groups and individuals. Be sure to tell them where you saw it! Here is a short list to help you find some of them:

SINC-LINK	CATS NEWSLETTER
14 RICHOME COURT	P.O. BOX 11017
SCARBOROUGH, ONTARIO, CANADA	TAKOMA PARK, MD 20913
M1K 2Y1 \$20/YR MEMBERSHIP	\$12/YR

ZXIR CLIVE ALIVE!	UPDATES
335 W. NEWPORT ROAD	513 EAST MAIN
HOFFMAN ESTATES, IL 60195	PERU, IN 46970
\$10/YR TO: ABED KHALE	\$18/YR

LIST	QZX
5 PERI LANE	2025 O'DONNELL DRIVE
VALLEY STREAM, NY 11581	LAS CRUCES, NM 88001
\$16/YR LG S.A.S.E./FREE SAMPLE	\$15/YR

I.S.T.U.G. (INDIANA)	SMUG BYTES
513 EAST MAIN	2461 S. 79TH STREET
PERU, IN 46970	WEST ALLIS, WI 53219
\$12/YR	\$10/YR

THE PLOTTER	THE HACKER (PC SHAREWARE)
14784 S. QUAIL GROVE CIRCLE	2345 MOORPARK WAY
OREGON CITY, OR 97045	HENDERSON, NV 89014
\$12/YR TO: RMG ENTERPRISES	\$15/YR TO: STEVE SAWCHUCK, JR.

NITE-TIMES NEWS  
417 S. 47TH AVENUE  
BELLWOOD, IL 60104  
\$12/YR

**Keep watchin' for more news!** Rod Gowen, Owner, RMG Enterprises

14784 South Quail Grove Circle, Oregon City, OR 97045  
503/655-7484 8AM-6PM PT \* FAX/VOICEMAIL: 503/655-4116 24 HRS

